

What is claimed is:

1. A method for switching communication modes for shifting an exchange from a frame relay exchange to an ATM exchange in a communication system having a plurality of exchanges each accommodating a plurality of terminals and including a frame relay exchange and having a network for connecting the plurality of exchanges to each other in order to transfer data among said plurality of terminals, comprising

10 a first step of selecting any one exchange among said plurality of exchanges,

a second step of operating said selected exchange as a frame/cell compatible type exchange capable of operating for both of frames and cells, and

15 a third step of executing said first step and second step for an exchange which has not yet been selected and

repeating said third step to autonomously shift all said exchanges to said ATM exchanges.

2. A method for switching communication modes as set forth in claim 1, wherein, in said second step,

whether an opposing exchange or an opposing terminal of an other party of communication operates for frames or operates for cells is registered on said selected exchange side in advance as office data, and

the selected exchange is operated as an exchange operating for frames or an exchange operating for cells according to the office data.

3. A method for switching communication modes as set forth in claim 1, wherein, in said second step,

whether an opposing exchange or an opposing terminal of another party of communication operates for frames or operates for cells is

35 automatically identified in said selected exchange, and the selected exchange is operated as an exchange operating for frames or an exchange operating

for cells according to the result of the identification.

4. An exchange provided with:

an ATM side bus and a frame side bus
provided in parallel,

5 a frame/cell compatibility function unit
inserted in said ATM side bus, and
a frame/cell switch unit for alternatively
switching between said ATM side bus and frame side bus.

10 5. An exchange as set forth in claim 4, wherein
said frame/cell compatibility function unit is comprised
of an ATM switch and a frame/cell format converting unit
connected to the ATM switch.

15 6. An exchange as set forth in claim 5, wherein
said frame/cell format converting unit is a frame
forwarding CLAD circuit.

7. An exchange as set forth in claim 4, wherein
said frame/cell switch unit switches alternatively
between said ATM side bus and frame side bus in
accordance with an instruction from the outside.

20 8. An exchange as set forth in claim 7, wherein
said instruction is given according to office data
registered in advance.

9. An exchange as set forth in claim 7, further
provided with:

25 a frame/cell detection unit for detecting
whether a signal input from the outside is comprised of
frames or cells,
said instruction being created in
accordance with the result of detection by this
frame/cell detection unit.

30 10. An exchange as set forth in claim 9, further
provided with:

a pair of said frame/cell switch units
formed at the two end portions of said ATM side bus and
frame side bus provided in parallel and
a switch control unit for receiving as
input the result of detection by said frame/cell

detection unit and controlling said pair of interlocked frame/cell switch units.

11. An exchange as set forth in claim 9, wherein
said frame/cell detection unit is comprised of a cell
synchronization circuit.

12. An exchange as set forth in claim 9, wherein
said frame/cell detection unit has

an identifying means for monitoring for
cell synchronization during a first time t1 and
automatically identifying that an opposing exchange or an
opposing terminal of another party of communication
operates for frames when detecting that cell
synchronization cannot be established during the time t1.

13. An exchange as set forth in claim 9, wherein
said frame/cell detection unit has

an identifying means for monitoring for
cell synchronization during a first certain time t1 and
automatically identifying that an opposing exchange or an
opposing terminal of another party of communication
operates for cells when detecting that cell
synchronization can be continuously established during
the time t1.

14. An exchange as set forth in claim 9, wherein,
when said frame/cell detection unit detects that a signal
input from the outside is comprised of frames, said
frame/cell switch unit switches to said frame side bus
and passes the frames through the frame side bus while
maintaining the signal format.

15. An exchange as set forth in claim 9, wherein,
when said frame/cell detection unit detects that a signal
input from the outside is comprised of cells, said
frame/cell switch unit switches to said ATM side bus,
inputs the cells to said frame/cell compatibility
function unit, processes the cells and converts them to
the frame signal format, then passes the same through the
ATM side bus.

16. An exchange as set forth in claim 14, wherein

said frame/cell detection unit has
an identifying means for subsequently
monitoring for cell synchronization during a second
certain time t2 while passing said frames through said
5 frame side bus while maintaining the signal format and
automatically identifying that an opposing exchange or
opposing terminal of another party of communication has
changed to one operating for cells when detecting that
cell synchronization could be established during the time
10 t2, and

15 said frame/cell switch unit switches the
bus to said ATM side bus, inputs the cells to said
frame/cell compatibility function unit, processes the
cells and converts them to the frame signal format, and
then passes the same through the ATM side bus.

17. An exchange as set forth in claim 15, wherein
said frame/cell detection unit has

20 an identifying means for subsequently
monitoring for cell synchronization during a third
certain time t3 while passing said cells through said ATM
side bus and automatically identifying that an opposing
exchange or opposing terminal of another party of
communication has changed to one operating for frames
when detecting that cell synchronization cannot be
25 established during the time t3, and

said frame/cell switch unit switches the
bus to said frame side bus and passes the frames through
the frame side bus while maintaining the signal format.

30 18. An exchange as set forth in claim 12 or 13,
wherein when communicating with said opposing exchange or
opposing terminal via high speed digital dedicated lines,
said monitoring is carried out in units of B channels × N
(N is 1, 2, 3, ...).

35 19. An exchange as set forth in claim 12 or 13,
wherein when communicating with said opposing exchange or
opposing terminal via an ISDN backup channel at the time
of a line fault, said monitoring is carried out with

respect to the related communication in units of B channels \times N (N is 1, 2, 3, ...) during the period from completion of the connection to the ISDN backup channel to restoration of the channel due to the end of the line fault.

5 20. An exchange as set forth in claim 7, further provided with a system console, the switch state to said ATM side bus or to frame side bus by said frame/cell switch unit being displayed on the system console.

10 21. An exchange as set forth in claim 12 or 13, wherein said first certain time t_1 is registered in units of B channels \times N (N is 1, 2, 3, ...) or in units of channels by a command from the outside.

15 22. An exchange as set forth in claim 16, wherein said second certain time t_2 is registered in units of B channels \times N (N is 1, 2, 3, ...) or in units of channels by a command from the outside.

20 23. An exchange as set forth in claim 17, wherein said third certain time t_3 is registered in units of B channels \times N (N is 1, 2, 3, ...) or in units of channels by a command from the outside.

25 24. An exchange as set forth in claim 7, wherein whether an opposing exchange or an opposing terminal of another party of communication operates for frames or operates for cells as office data is registered in units of B channels \times N (N is 1, 2, 3 ...) or in units of channels.

30 25. An exchange as set forth in claim 9, wherein the fact that the identification of whether the opposing exchange or opposing terminal of the other party of communication operates for frames or operates for cells should be automatically identified by said frame/cell detection unit is registered as the office data in units of B channels \times N (N is 1, 2, 3, ...) or in units of channels.